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basic imagery interpretation report

# **Activity and Developments at Soviet Solid Propellant Research and Development Facilities (S)**

**STRATEGIC WEAPONS INDUSTRIAL FACILITIES**

**BE: Various**

**USSR**

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**RCA-09/000<sup>E/00</sup>**

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**JUNE 1980**

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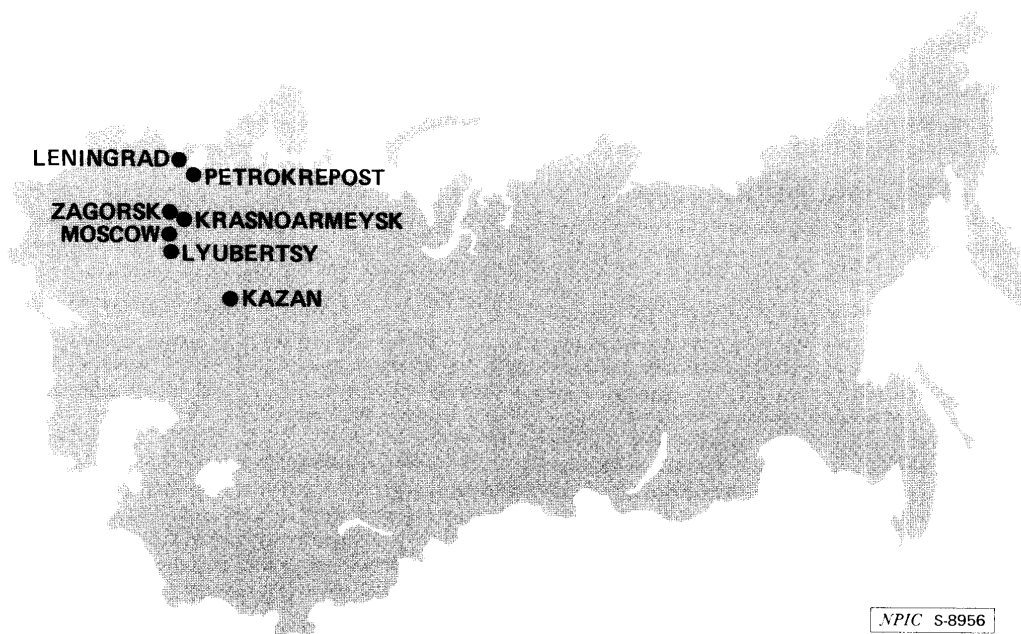
INSTALLATION OR ACTIVITY NAME					COUNTRY
Activity and Developments at Soviet Solid Propellant Research and Development Facilities					UR
UTM COORDINATES	GEOGRAPHIC COORDINATES	CATEGORY	BE NO.	COMIREX NO.	NIETB NO.
NA	See below	See below	See below	See below	See below
MAP REFERENCE					
ACIC. USATC; Series 200; Sheets 0103-25, 0153-04, 0154-23, 0165-01, and 0167-05; scale 1:200,000					
LATEST IMAGERY USED			NEGATION DATE (if required)		
See "Abstract"			NA		

Installation Name	Geographic Coordinates	Category	BE No	COMIREX No	NIETB (MRN) No
Moskva Solid Motor Production Plant Lyubertsy	55-36-48N 037-52-40E				
Leningrad Institute of Applied Chemistry (GIPKh)	59-56-56N 030-17-54E				
Petrokrepost Explosives & Solid Motor Plant Morozov	59-59-14N 030-59-35E				
Leningrad Solid Motor Test Facility I	60-04-01N 030-36-15E				
Kazan Missile Propulsion R&D Facility	55-53-45N 048-50-07E				
Zagorsk Solid Propellant R&D Facility	56-17-59N 038-09-13E				
Krasnoarmeysk Solid Motor Development Facility	56-06-40N 038-10-20E				
Krasnoarmeysk Isolated Motor Test Area	56-10-15N 038-14-12AE				

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ABSTRACT

1. (TSR) This report describes activity and developments at eight Soviet solid propellant rocket motor research and development (R&D) facilities. At Moskva Solid Motor Production Plant Lyubertsy, a new probable laboratory/test building was observed under construction. At Petrokrepost Explosives and



NPIC S-8956

FIGURE 1. LOCATIONS OF EIGHT SOVIET SOLID PROPELLANT ROCKET MOTOR RESEARCH AND DEVELOPMENT FACILITIES

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Solid Motor Plant Morozov, several possible rocket motors/containers were observed, and construction continued on the new probable propellant production line and on several large buildings. At Leningrad Solid Motor Test Facility 1, probable SA-5 booster crates were observed for the first time; an environmental cover was seen on the twin-arm launcher; and several new probable/possible rocket motors/containers were observed in the structural/vibration nondestructive test area. At Kazan Missile Propulsion R&D Facility, new plant expansion increased the available space by approximately 74 acres; several possible rocket motors/containers were seen; and construction continued on several new buildings. At Zagorsk Solid Propellant R&D Facility, two new administration/engineering buildings were under construction. At Krasnoarmeysk Solid Motor Development Facility, five new probable/possible rocket motors and the results of six tests were observed; construction of a new probable rocket motor assembly/checkout area continued; and SS-N-14 shipping crates were observed for the first time in the munitions loading and storage area.

2. (TSR) This report updates a previous NPIC basic report on each of the eight Soviet facilities. The current reporting period for each facility is as follows:

Installation	Current Reporting Period
Moskva Solid Motor Production Plant Lyubertsy	
Leningrad Institute of Applied Chemistry (GIPKh)	
Leningrad Solid Motor Test Facility 1	
Petrokrepost Explosives & Solid Motor Plant Morozov	
Kazan Missile Propulsion R&D Facility	
Zagorsk Solid Propellant R&D Facility	
Krasnoarmeysk Solid Motor Development Facility	
Krasnoarmeysk Isolated Motor Test Area	

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This report contains a map, 17 photographs, and four tables.

## INTRODUCTION

3. (TSR) At each of the installations discussed in this report, a significant contribution has been made to Soviet solid propellant rocket motor R&D programs (Figure 1). Collectively, these facilities represent a significant part of the Soviet effort in this field.

4. (TSR) This report updates a previous NPIC report [redacted] All applicable satellite imagery acquired between [redacted] was exploited in the preparation of this report.

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## BASIC DESCRIPTION

### Moskva Solid Motor Production Plant Lyubertsy

5. [redacted] Moskva Solid Motor Production Plant Lyubertsy is an R&D facility engaged in the development and evaluation of prototype propellants and production standards, motor fabrication, and static test firing of new solid propellant rocket motors and possibly hybrid motors for both strategic and tactical systems. No buildings at this production plant appear to be devoted solely to engineering and/or laboratory research. The basic engineering and research functions are probably provided by the Moskva Explosives Propellants R&D Facility Lyubertsy [redacted], approximately 2 nautical miles (nm) northwest of the solid motor production plant. The two facilities together make up the Scientific Research Institute 125 (NII-125).<sup>1</sup>

6. (TSR) No new probable rocket motors were observed from [redacted] the current reporting period. The [redacted]

open storage yards of the plant, where new probable rocket motors have been observed in the past, contain the same number and types of crates and probable rocket motors/containers reported in the previous report.<sup>1</sup>

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7. (TSR) One unidentified possible container, [redacted] in diameter, was observed along the eastern fence to the rear of a laboratory building (Figure 2).

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8. (TSR) Building construction and plant expansion have continued since the previous reporting period.<sup>1</sup> A fourth, large cylinder, [redacted] long by [redacted] in diameter, has been placed on chock blocks on the concrete apron behind the laboratory test building near one of the storage yards.

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9. (TSR) A new probable laboratory/test building was in the midstage of construction in June 1979 (Figure 3). The building was first observed under construction in May 1978. The probable laboratory/-

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test building, 73 meters long and 18 meters wide, will contain at least ten test cells. Each test cell is 14 meters long by 9 meters wide.

### Leningrad Institute of Applied Chemistry (GIPKh)

10. [ ] Leningrad Institute of Applied Chemistry (GIPKh) is in the center of Leningrad on the north bank of the Malaya Neva River. The institute is engaged in R&D of solid and liquid propellants, propellant storage tanks, nozzles, combustion chambers, and toxic gases.<sup>2</sup> The institute contains approximately 43 irregularly shaped buildings and can be divided into five functional areas—administration, engineering/laboratory, pilot production, testing, and support. GIPKh is closely associated with seven other missile-related installations in the Leningrad area. These facilities are Toksovo Propulsion Research and Production Plant GIPKh (BE [ ] Petrokrepost Explosives and Solid Motor Plant Morozov ( [ ] Leningrad Solid Motor Test Facility 1 ( [ ] Leningrad Solid Motor Test Facility 2 ( [ ] Leningrad Solid Motor Test Facility 3 ( [ ] Primorsk Rocket Engine Test Facility ( [ ] and Zelenogorsk Rocket Engine Test Facility ( [ ]<sup>3</sup> No missile-related components, equipment, or vehicles have been identified at GIPKh.

11. (TSR) During the reporting period, [ ] construction of a three-story building and an adjacent associated structure continued at a slow pace. Construction was begun on the building in February 1974 and on the adjacent structure in May 1975. The building is 30 by 25 meters and is probably connected to the structure. The location of the building and structure relative to the locations of the pilot production and test areas suggests either a laboratory and/or test function for both the building and the adjacent structure.

### Petrokrepost Explosives and Solid Motor Plant Morozov

12. (TSR) Petrokrepost Explosives and Solid Motor Plant Morozov (Figure 4) is a solid propellant R&D installation where double-base, composite, and

probable composite-modified double-base (CMDDB) propellants can be produced. Static test facilities for the plant are at Leningrad Solid Motor Test Facility 1.

13. (TSR) The plant consists of 11 functional areas. During the reporting period, [ ] building construction was observed in three of the plant areas—the double-base propellant production area, the test cell area, and the composite propellant production area. Construction activity on the new probable production line (Figure 5) and the new probable laboratory/test building (Figure 6) progressed slowly.

14. (TSR) One building and footings for a second building were under construction in the composite propellant production area. The building is 54 meters long by 19 meters wide. The footings are 82 meters long by 45 meters wide.

15. (TSR) On [ ] long blast mark was observed at one of the test cells in the test cell area. This was the only photographic evidence of test activity at the plant between [ ]

16. (TSR) Several possible rocket motors/ motor containers and one cylinder were observed within the facility during the reporting period (Table 1).

17. [ ] Developmental motors can be produced at Petrokrepost since it is a solid propellant R&D facility. The upper stages for the SS-16 and SS-20 missile systems have been produced here.<sup>4</sup> Current production includes the second-stage motors for the SS-20 system and limited production of FROG motors.<sup>5</sup> Missile component railcars load and unload missile-related components inside missile assembly/-checkout buildings (Figure 7), thereby limiting the capability to view new motors for new systems or accurately account for motors of existing systems.

### Leningrad Solid Motor Test Facility 1

18. (TSR) Leningrad Solid Motor Test Facility 1 (Figure 8) is a static test facility for Petrokrepost Explosives and Solid Motor Plant Morozov, 12 nm to the east-southeast. The facility contains a static test area with four barricaded horizontal test cells and an instrumentation and control building; a structural/vibration nondestructive test area and an artillery and projectile test area containing a projectile test range-

(Continued p. 8)

**Table 1.**  
**Rocket Motors/Containers and Cylinders**  
**Observed at Petrokrepost Explosives and**  
**Solid Motor Plant Morozov**

*This table in its entirety is classified TOP SECRET RUFF*

Objects	Date	Dimensions (m)		Remarks
		L	D	
1 cylinder				In double-base area
1 prob motor				In composite propellant production area
1 prob motor				In composite propellant production area
1 poss motor/container				In test cell area
1 poss motor/container				In test cell area
3 poss motors/containers				In composite propellant production area
1 prob motor				In composite propellant production area
1 poss motor/container				In prob propellant processing area
1 poss motor/container				In prob propellant processing area
1 poss motor/container				In prob propellant processing area

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**Table 2.**  
**Rocket Motors/Containers, Cylinders and Shipping Crates**  
**Observed at Leningrad Solid Motor Test Facility 1**

*This table in its entirety is classified TOP SECRET RUFF*

Objects	Date	Dimensions (m)			Remarks
		L	D	W	
2 cylinders					Behind nondestruct test bldg
1 poss motor					Behind nondestruct test bldg
1 poss shipping crate					Near nondestruct test bldg
2 poss motor/container					Behind nondestruct test bldg
6 poss motors/motor segments					Near nondestruct test bldg
4 poss motors					Near nondestruct test bldg
1 poss motor/container					Near nondestruct test bldg
1 poss motor/container					Near nondestruct test bldg
1 poss motor/container					Near nondestruct test bldg
3 prob SA-5 booster crates					Near nondestruct test bldg
5 shipping crates					Near nondestruct test bldg
1 expended motor					In boneyard
1 expended motor					In boneyard
8 shipping crates					In boneyard
1 poss motor/container					Near platform at test cell 1
1 poss motor/container					New platform at test cell 1
1 poss motor/container					Near platform at test cell 1
1 poss motor/container					Near platform at test cell 1
2 cylinders					Near nondestruct test bldg
4 poss motors					Near nondestruct test bldg
1 cylinder					Near nondestruct test bldg

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head and a vertical test position and twin-arm launcher. A boneyard for expended rocket motors is between the static test area and the structural/vibration nondestructive test area. The reporting period for Leningrad 1 is

19. (TSR) Only very minor construction activity has been observed at the test facility since the date of the previous NPIC report.<sup>1</sup> A concrete oval track, possibly for the construction of new projectile test positions, was under construction on the west end of the artillery and projectile test range.

20. (TSR) Several new large cylinders, probable/possible rocket motors/containers and shipping crates were observed in the structural/vibration nondestructive test area (Figures 9 and 10) from.

Table 2 lists the dimensions of the cylinders, rocket motors/containers, and shipping crates seen within the facility from March through August 1979. Three probable SA-5 booster crates were observed for the first time at a barricaded nondestruct test building on (Figure 11). The crates, are similar in size and configuration to SA-5 booster crates seen at Leningrad Guided Missile Production Plant 458 and at the double-base propellant plant Kamensk-Shakhtinsky Chemical Combine 101

21. (TSR) Two new expended motors were observed in the boneyard in June 1979. The motors were meters long by in diameter. From July through no motors/containers or crates were observed in the boneyard.

22. (TSR) An environmental cover was observed on the twin-arm launcher (Figure 12) in January 1979. SA-3/SA-N-1 and SA-N-3 shipping containers, which had been seen in varying numbers in front of the barricaded checkout building, were not observed after SA-3/SA-N-1 missile canisters, which had been continuously seen at Leningrad Solid Motor Test Facility 3 (BE) have not been seen since mid-1978.<sup>2</sup> The presence of the environmental cover on the twin-arm launcher and the absence of SA-3/SA-N-1 and SA-N-3 shipping containers suggest that testing of these missile systems may have ceased.

**Kazan Missile Propulsion R&D Facility**

23. ( ) Kazan Missile Propulsion R&D Facility (Figure 13) is the experimental test facility for the P. F. Zubets Motor Design Bureau. The propulsion R&D facility, which is approximately 9 nm east-northeast of Kazan Aircraft Engine Plant 16 (BE) includes facilities for testing solid rocket motors, liquid rocket engines, hybrid rocket engines, integrated rocket-to-ramjet systems, high-energy lasers, and rocket- or engine-driven power sources for The primary functions of the R&D facility are testing, research, and evaluation; its capabilities, to date, have not included manufacturing or production. The Zubets Design Bureau, located primarily at Kazan Aircraft Engine Plant 16, is assessed to have been responsible for the development of the propulsion system used on the sustainer stage

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of the SA-4 and the booster stage of the ABM-1. The design bureau is involved with the design/development of several propulsion systems that will probably be used for new defensive missile systems destined for the ground forces and the PVO Strany forces. These systems include solid propellant motors designated 9D128, 9D126, 9D131, 5S73, 5G65, and 5S24. The Zubets Design Bureau is dependent upon other facilities, in addition to Kazan Aircraft Engine Plant 16, for the production of solid propellants, rocket motor cases, and liquid fuels and for the use of additional static test facilities. Several of the facilities which have a close working relationship with the Zubets Design Bureau are Safonovo Plastics and Guided Missile Component Plant ( ), Sverdlovsk Guided Missile Production Plant 8 ( ), and Perm Solid Motor Production Plant ( ).

24. (TSR) Possible shipping canisters and numerous aircraft engine and probable missile component crates continued to be seen at Kazan R&D facility during the reporting period. ( )

( ) The possible shipping canisters were ( ). The aircraft engine and probable missile component crates most frequently observed ranged from ( )

( ) meters, respectively. The continued presence of these canisters and crates within the facility provides evidence that Kazan is actively involved in several test research programs. Three possible shipping containers were observed at the probable solid motor assembly/checkout building in September 1979. The three containers are ( )

25. (TSR) A significant expansion program has been underway at the Kazan R&D facility since ( ). The security fence has been extended increasing available space by 74 acres (Figure 13). Within the security perimeters, new construction (Table 3) observed included an administration/engineering building, an addition to the steamplant, two storage buildings, a concrete apron, and a probable conduit which may connect the separately secured unidentified building with the concrete apron. The addition of 74 acres and, to date, 8,194 square meters of roof cover will greatly increase the capacity to develop new propulsion systems and related components as well as possibly adding some manufacturing/fabrication capabilities.

#### Zagorsk Solid Propellant R&D Facility

27. ( ) The Zagorsk Solid Propellant R&D Facility (Figure 14) is a solid propellant design bureau responsible for the R&D of new solid propellants and/or missile hardware. The facility is in the southern part of the city of Zagorsk, 38 nm northeast of the center of Moscow and 13 nm northwest of Krasnoarmeysk Solid Motor Development Facility. The facility can accommodate limited proto-

type production as well as altitude simulation testing of components and/or small solid propellant rocket motors. The facility can be functionally grouped into five areas—administration/engineering, propellant production/processing and testing, inert operations, laboratory, and support. A subsurface personnel bunker is separately wall enclosed outside the east wall of the design bureau.

28. (TSR) During the reporting period, ( ) two administration/engineering buildings were under construction in the northern section of the plant. One of the administration/engineering buildings, which was in a late stage of construction, is 36 by 15 meters and is four stories high. The other building, in the midstage of construction, is 27 by 10 meters. When complete, the building will probably be four stories high.

29. (TSR) No missile-related equipment or vehicles were observed at the facility during the reporting period.

#### Krasnoarmeysk Solid Motor Development Facility

30. ( ) The Krasnoarmeysk Solid Motor Development Facility (Figure 15) is involved in the development of rocket motors and their component parts and also in the limited production of prototype motors. The facility functions as an R&D center for all new solid propellant rocket motors produced in the Soviet Union.

31. (TSR) The solid motor development facility consists of ten widely scattered areas. These areas include a probable missile receiving and checkout area; a rocket motor assembly, checkout, and test area; the original design bureau 3 and an associated probable rocket motor production section; the original design bureau 3 test area; a probable missile/motor and munitions receiving, checkout, and finishing area; a possible missile storage/support area; a missile motor/engine and munitions development and fragmentation test area; a new probable rocket motor assembly/checkout area; a munitions loading and storage area; an air-breathing engine test area; and an administration and support area. Construction and/or test-related activity was observed in seven of these areas during the reporting period. ( )

through ( ) The Krasnoarmeysk Isolated Motor Test Area is an integral part of the complex. The reporting period for this facility is ( )

#### Rocket Motor Assembly, Checkout, and Test Area

32. (TSR) Evidence of test activity and test-related activity was observed during the reporting period. At least five static tests were conducted at the small and large horizontal test cells between ( ) ( ) A blast mark, 190 by 80 meters, was observed extending from the small test cell on ( ) On ( ) a blast mark, 279 by 110 meters, was seen extending from the large test cell. A blast mark was observed extending 250 by 70 meters and 188 by 59 meters from the large and small horizontal test cells, respectively, on ( ) another blast mark, 190 by 65 meters, was observed extending from the small horizontal test cell. At the same time,

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an earthen barricade was under construction at the end of the blast apron of the large horizontal test cell. The construction activity suggests that site improvements or test preparations were underway.

33. (TSR) Two possible containers/cylinders were observed on [ ] on a railcar (Table 4) on the rail siding near the large test cell. One possible container was [ ] meters in diameter. The other possible container was [ ] in diameter and was partially canvas covered.

34. (TSR) Construction progressed slowly on the addition to the steamplant and on the installation of underground pipelines through the northern section of the area.

**Probable Missile Receiving and Checkout Area**

35. (TSR) Three missile receiving and checkout buildings are in the probable missile receiving and checkout area. Each building is road and rail served. Three types of naval shipping crates—SS-N-2, SS-N-3/12, and SS-N-9—continued to be observed along the rail sidings extending to the missile receiving and checkout buildings.

36. (TSR) Two cylinders and two probable rocket motors/containers, [ ] were observed on the rail siding near the southern missile receiving and checkout building (Table 4).

**Missile Motor/Engine and Munitions Development and Fragmentation Test Area**

37. (TSR) A blast mark, 120 by 40 meters, was observed extending from the test cell on [ ]. There was no evidence of the presence of any rocket motors within the area.

**New Probable Rocket Motor Assembly/- Checkout Area**

38. (TSR) Construction was continuing in the new probable rocket motor assembly/checkout area (Figure 16) in the northwestern corner of the missile motor/engine and munitions development and fragmentation test area. This new area is wall enclosed and completely secured from the rest of the development and fragmentation test area. To date, the area is road served only. The area consists of six buildings, including two probable assembly/checkout buildings. One of the buildings appeared to be externally complete, while the other was in the midst of construction.

**New Possible Missile Storage/- Support Area**

39. (TSR) A new possible missile storage/support area is immediately north of the rocket motor assembly, checkout, and test area. The area is not separately secured and is road served only. The area consists of six storage/support buildings. Two probable rocket motors/containers, [ ]

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**Table 4.**  
**Rocket Motors/Containers, Cylinders, and Shipping Crates Seen**  
**At Krasnoarmeysk Solid Motor Development Facility**

*This table in its entirety is classified TOP SECRET RUFF*

Objects	Date	Dimensions (m)			Remarks	
		L	D	W		
<b>Rocket Motor Assembly, Checkout, and Test Area</b>						
1 cylinder				—	Near rail siding	25X1
1 cylinder				—	Near rail siding	
1 cylinder				—	Near rail siding	
1 cylinder				—	Near rail siding	
1 cylinder				—	Near rail siding	
2 cylinders				—	Near rail siding	
3 cylinders				—	Near rail siding	
1 cylinder				—	Near rail siding	
1 poss container/cylinder				—	On railcar	
1 poss container/cylinder			—	On railcar; partially canvas covered		
<b>Prob Missile Receiving and Checkout Area</b>						
2 cylinders				—	Rail siding	25X1
1 prob motor/container				—	Rail siding	
1 prob motor/container				—	Rail siding	
1 prob motor				—	Rail siding	
<b>Poss Missile Storage/Support Area</b>						
1 prob motor/container				—	Near storage bldg	25X1
1 prob motor/container				—	Near storage bldg	
<b>Munitions Loading and Storage Area</b>						
2 shipping crates					In front of storage bldg	25X1
1 shipping crate					In front of storage bldg	
2 shipping crates					In front of storage bldg	
1 shipping crate					In front of storage bldg	
2 shipping crates					In front of storage bldg	
1 shipping crate					In front of storage bldg	
1 shipping crate					In front of storage bldg	
1 shipping crate					In front of storage bldg	
1 shipping crate					In front of storage bldg	
<b>Isolated Motor Test Area</b>						
1 prob motor					In horizontal test position	

[REDACTED] were observed for the first time in this area of the plant on [REDACTED] (Table 4).

#### Original Design Bureau 3 and Associated Probable Rocket Motor Production Section

40. (TSR) Construction materials and construction equipment was observed in the probable rocket motor production section. A revetted storage building had been partially damaged by an explosion and/or fire when the facility was observed on [REDACTED]. The building had been completely removed by [REDACTED]. The continued presence of construction materials and equipment suggests that the plant or sections of the plant will be modified or modernized to accommodate possibly new missile systems.

#### Munitions Loading and Storage Area

41. (TSR) Several types of shipping crates (Table 4) in addition to SS-N-3/-12 and SS-N-9 shipping

crates were observed in the munitions loading and storage area. On [REDACTED] one SS-N-14 shipping crate (Figure 17) was observed in the area for the first time. When the area was next observed in May, the SS-N-14 was not present. The SS-N-14 shipping crate was again observed on [REDACTED] in the area. Between [REDACTED] no SS-N-14 crates were present.

#### Krasnoarmeysk Isolated Motor Test Area

42. (TSR) A blast mark, 296 by 95 meters, was observed extending from the horizontal test position on [REDACTED]. A probable rocket motor, [REDACTED] long by [REDACTED] in diameter, was observed for the first time in the horizontal test position on [REDACTED] (Figure 18 and Table 4). In the past, rocket motors have been observed only in the adjacent vertical test stand. On [REDACTED] unidentified material was observed near the horizontal test position, suggesting that test activity had occurred or that preparations for testing were underway.

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## REFERENCES

## IMAGERY

(TSR) All applicable KEYHOLE imagery acquired through the information cutoff date of [ ]  
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## MAPS OR CHARTS

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\*Extracted information is releasable.

## REQUIREMENT

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Project 200012DJ

(S) Comments and queries regarding this report are welcome. They may be directed to [ ] Soviet Strategic Forces Division, Imagery Exploitation Group, NPIC, [ ]

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